TRMM Flight Operations Monthly Status Review (MSR)

May 2nd, 2001

FOT Subsystem Overview

- Operations Status
  - Flight Ops Summary - Lou Kurzmiller
  - Electrical & Thermal - Andy Calloway
  - ACS & FDS / C&DH - Mark Fioravanti
  - RCS & RF / Comm - David Corley
  - Power & Deployables - Justin Knavel
  - LIS - Justin Knavel
  - CERES & VIRS - Mark Fioravanti
  - TMI - David Corley
  - PR - Andy Calloway
  - Ground System - Dan Palya
  - Upcoming Activities - Andy Calloway

Flight Operations Summary

- Supported 528 SN events in April
  - 2 Yaw Maneuvers
  - 12 Delta-V Maneuvers
- 1 Anomaly Rpt; 4 Event Rpts & 2 Generic Late Acq Rpts generated
  - AR #86: Position Error spikes seen in ancillary tlm packet
  - ER #228 MOC S/W; Hist Frame Logger, file corrupted
  - ER #229 & #231 SN; Events deleted for Shuttle/ISS
  - ER #230 SN; Loss of UPD's during generic late acq event
  - 2 Late Acq w/171; no data loss

Flight Operations Summary

- Notable Events
  - MOC updates:
    - » 9 Gbyte GTAS drive installed in MOC
    - » 4 Gbyte drive installed in SOTA 7
  - Bldg-23 power outage (PACOR-II & DDF)
  - TRMM EOL Review
  - 2 console analysts left FOT

Flight Ops Summary

SPECIAL SPACECRAFT EVENTS AND ACTIVITIES FOR TRMM 2001

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTALS
2	8	7	10	12									37
2a	1	1	1	2									5
2b	0	0	0	0									0
2c	0	0	0	0									0
3	1	0	1	1									3
3a	1	4	2	9									16
3b	3	2	1	3									9
3c	1	1	1	5									8
3d	0	0	0	0									0
3e	1	0	0	0									1
3f	2	2	5	2									11
4	3	1	0	0									4
4a	0	2	2	2									6
4b	1	1	2	1									5
4c	0	0	0	0									0
4d	5	0	3	8									16
4e	0	0	0	1									1
5	3	0	2	4									9
5a	0	0	0	0									0
5b	0	5	0	0									5
5c	0	0	0	0									0
TOT:	30	26	30	50	0	0	0	0	0	0	0	0	136

LEGEND

	STANDARD CATEGORIES	TRMM-SPECIFIC SUB-CATEGORIES AND EXAMPLES
1	Targets of Opportunity	N/A
2	S/C Maneuvers	DeltaVs **(2)** , 180° Yaw Maneuvers **(2a)** , 90° Yaws **(2b)** , Deep Space Cals **(2c)**
3	Unplanned Commanding	Blind Acqs **(3)** , Patch Loads **(3a)** , Manual DS Ops due to Blind Acqs, MI, etc. **(3b)** , EPVs Fail **(3c)** , VIRS Reset Ops **(3d)** , Anomaly Recoveries **(3e)** , Generic Late Acqs - GCMRs / DS Ops **(3f)**
4	Customer Requests	PR **(4)** , VIRS **(4a)** , LIS **(4b)** , CERES **(4c)** , FSW **(4d)** , AETD **(4e)**
5	Ops due to Celestial Phenomena	UTCF / FS Ops **(5)** , Power Ops - Autospru, TSMs, C/D **(5a)** , Xpdr Offset Ops **(5b)** , Leonids **(5c)**
6	Pre-Launch Testing	N/A
7	L&IOC Operations	N/A
8	EOL Operations	Delta-H Firings **(8)** , Reentry Maneuvers **(8a)**

NOTE: This Record Documents S/C Activities and Does Not Include Other Special Activities Such as Ground Systen Testing, Simulations, Trending, or New Database, Script, Code, or Procedure Development...

Thermal / Electrical Subsystems

- Thermal subsystem remains nominal; no open issues other than AETD will try to confirm whether one omni antenna is more vulnerable to atmospheric heating just prior to reentry

- No relay or Electrical issues; looking into the possibility of ESD as a factor in the ACS ancillary position error anomaly

ACS Subsystem

- Multiple EPV failures due to maneuver frequency and solar flux levels this month.
  - Due to Post maneuver products which are not optimal, and variable atmospheric drag.
- ACS Ancillary Position Error Jumps (Anomaly #86)
  - 1 count spikes seen only in Ancillary Packets, not in any other packets, in the Position Error (All three Axes).
  - Spikes to not achieve the same magnitude.
  - No correlation with orbital location, geolocation or SAA.
  - ACS does not react since this telemetry is filtered before being used.
  - Trending is now be performed daily to see if a pattern develops.
  - FDCs (75-77) require 80 consecutive seconds to fail, limit is 0.524 radians, so there has been no impact.

ACS Subsystem

ACS Ancillary Packet Information					
		ROLL	PITCH	YAW	
DATE	DOY	ACPOSERRXA	ACPOSERRYA	ACPOSERRZA	TSDIS
03/18/2001 06:39:49	077	-3.938188E+11	1.500000E-05	8.000000E-06	Y
04/13/2001 09:55:16	103	3.100000E-05	-9.820596E+13	-2.000000E-06	Y
04/13/2001 14:41:45	103	-4.300000E-05	-5.769789E+00	-4.000000E-06	Y
04/14/2001 11:21:10	104	-2.200000E-05	-3.700000E-05	-4.734988E+35	Y
04/15/2001 18:07:26	105	-4.243580E-05	-1.360510E+22	2.493620E-06	Y
04/16/2001 06:07:01	106	-6.979450E-05	4.768180E-05	-2.886070E+31	Y
04/16/2001 13:03:11	106	-2.717490E+32	1.217540E-04	2.835840E-05	Y
04/17/2001 05:02:49	107	9.016950E+11	6.881670E-05	8.862130E-06	Y
04/17/2001 09:50:49	107	-1.008170E+14	-4.916450E-06	-1.005020E-05	Y
04/17/2001 23:18:05	107	-2.636470E-05	5.197320E-05	9.068460E+29	Y
04/18/2001 00:00:19	108	9.100000E-05	1.178464E+04	1.400000E-05	Y
04/18/2001 14:00:28	108	2.457984E+10	9.000000E-06	-4.000000E-06	Y
04/18/2001 21:39:26	108	6.000000E-06	-2.700000E-05	7.460283E+05	Y
04/20/2001 07:16:56	110	-8.000000E-06	-2.577385E+16	-9.000000E-06	Y
04/24/2001 09:26:01	114	-1.371400E-05	-4.166100E-05	1.154400E+32	
04/24/2001 12:05:17	114	-5.300100E+19	-5.165600E-05	-4.882300E-06	
04/24/2001 13:09:33	114	1.978800E-05	7.565600E+36	-1.564300E-02	
04/24/2001 14:26:01	114	-7.113000E-06	1.233800E-05	9.018800E+29	
04/25/2001 15:51:23	115	9.430900E+35	4.163200E-05	-7.549500E-06	

ACS Subsystem

- Open ACS CCRs (In order of Priority);
  - CCR #069: New table 85 to match new TDRS-8 continuity limits for other TDRS, and another table 85 to widen the limits after an update failure.
  - CCR #070: New version of Table 61 to incrementally pitch the S/C while in Sun Acq, if Solar Array fails.
  - CCR #005: Correction for Magnetic Field Epoch, if contingency mode is required for EOL activities.
  - CCR #065: Update ACS system tables in preparation for EOL activities.
    - » Table #73 (Thruster Parameters)
    - » Table #90 (Mode Configuration Data for Contingency)
  - CCR #053: ACS FS/W bug

FDS/C&DH Subsystems

- UTCF Status;
  - Four Adjustments were performed. One on 01-090 (Sat. March 31st), another on 01-101 (Wed. April 11th), on 01-111 (Sat. April 21st), and the fourth one on 01-120 (Mon., April 30th). The next one is expected on 01-152 (Fri. June 1st).
  - Current UTCF value is 31535996.824677 sec
  - No FS Adjustments were performed, next expected on 01-121 (Tues., May 1st) and will be adjusted by 12 counts to x'7C6'.
  - Current FS value is x'7BA'.
- Open CCRs;
  - CCR #047: Will work with FSW on no-clock software patch activities
  - CCR #048: New on-board DS filter table to record ACE 8-Hz data
  - CCR #077: Create a TSM to monitor the bus voltage incase of a PSIB telemetry failure.

RCS Subsystem

- RCS performed 12 successful Delta-V maneuvers (#291 - #302)
  - Current fuel remaining is 423.021 kg
- EOL estimate is approximately **March, 2003**, using 157kg of fuel as a baseline.
- No Open RCS Anomaly or Event Reports
- Upcoming Events
  - Begin review of, and training in, Delta-H procedures, EOL scripts, and a “one-shot” procedure.
  - Review all required steps for a 30+ minute Delta-V maneuver and test with the simulator.

RF Subsystem

- 2 Generic Late Acquisitions (#91-92)
  - 115/200900z T171 event: Locked up @ 201044z. One fwd reacq was sent. Dump was performed. All data recovered.
  - 117/142430z T171 event: Locked up @ 142535z. One fwd reacq was sent. Dump was performed. All data recovered.
- Frequency offsets (monthly average)
  - Transponder #1 = +713.551 Hz
  - Transponder #2 = -752.155 Hz
- No RF Event Reports or MOCRS this month
- Upcoming Events
  - Offset of transponder 2 frequency may occur in May.

Power Subsystem

- FSW is coding the S/C Processor Current filter. The filtered S/C Processor Current will be used to determine Essential Bus Voltage.
- Off-pointing the Solar Arrays by 55º
  - Test Plan Review completed
  - FSW is testing the 2 Tables with the simulator.
  - Operation scenarios will be developed

Deployables Subsystem

- Solar array drives and HGA continue to operate nominally.
- No other open issues.

LIS Instrument

- One Routine MSFC real-time command request was performed on 01-101 (April 11th) to reduce packet sequence errors
- No open issues

CERES/VIRS Instruments

- **CERES**, no change in status.
  - No Science collection due to, Data Acquisition Processor (DAP) Telemetry Drop Out and Possible Failure (Anomaly #81, 00-061 Jun 14th, 2000)
  - LaRC has plans on performing a series on Gimbal tests on the week of May 7th.
- **VIRS**, continues to operate nominally.
  - Two sets of VIRS Solar Calibrations were performed on 01-097 (Sat., April 7th).

TMI / PR Instruments

- No Open Issues with the TMI instrument

- No PR External Calibrations were performed in April
- No new PR interference was reported by NASDA in April
- Analysis continues as to the feasibility of operating the PR instrument at an altitude of 400 km in order to extend mission life - FDF is providing predicted orbit elements to NASDA

Ground System

- The new System Software Release 9.1 patch is complete and will be installed within the next several weeks. It will be delivered to SOTA-7 and String-2 first, then String-3. After final evaluation, it will be made operational on String-1.
- The backup test and command string in Building 14 SOTA-7 is operational for emergencies and training. Full Mission Planning scheduling and load-building and trending capabilities still need to be implemented and verified.
- PC for PACOR-A operations is installed and awaiting final Security acceptance prior to installation to the closed network.
- A GRO 9 GB hard drive has been installed on the GTAS trending workstation and the 4 GB drive it replaced is now in SOTA-7 for additional trending capability.
- The planned April 22nd Building 23 Power Outage (PACOR, DDF) recovery is complete and all data has been played back from WSC and delivered to all end-users.
- Two 100 MHz workstations will be installed in the MOC next week.

Upcoming Activities

- 0-2 Months
  - Award one Spacecraft Analyst Certificate
  - Complete the full Backup Control Center implementation including scheduling and mission planning
  - Complete Rel 9.1 installation to all strings and SOTA bay
  - Parallel operations with the new PACOR-A system and new web-based user interface training (ORR in June)
  - Test and install new Transponder-2 AOS Offset Relative Time Sequences
  - Install recently acquired GRO equipment - two 100 MHz workstations
  - Continue to close open CCRs, MOCRs, and MSR Action Items

Upcoming Activities

- 2-3 Months
  - Award two Console Analyst certifications to new employees
  - Complete testing and training with PSIB alternate telemetry patch
  - Complete testing and training with contingency SA 55° Offset configuration
  - End Of Life Planning, Testing, and Simulations continue